

the appended claims, the invention may be practiced otherwise than as specifically described herein.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. A method of repairing a joint between conductor elements of a stator winding bar of an electrical machine and a connecting device connected to an end of the stator winding bar for providing electrical connection and coolant flow for the conductor elements, the method comprising the steps of:

removing an existing connecting device from the end of the stator winding bar;

forming slots in the end of the stator winding bar and at locations such that said slots extend to locations where said conductor elements abut one another;

applying an electrically conductive first connecting part onto the end of the stator winding bar such that said first connecting part substantially surrounds said end of the stator winding bar; and

sealing said slots and any gaps between the end of the stator winding bar and said electrically conductive first connecting part.

2. The method of claim 1 wherein said sealing step comprises:

filling gaps between said first connecting part and an outer surface of said end of the stator winding bar with at least one first filler element;

filling said slots with at least one second filler element;

and heating at least one of said end of the stator winding bar and said first connecting part, wherein at least one of said first and second filler elements comprise at least one layer of a material which melts during said heating step, and adding sufficient additional meltable material to assure complete sealing of said gaps and slots.

3. The method of claim 1 wherein said sealing step comprises:

filling gaps between said first connecting part and an outer surface of said end of the stator winding bar with at least one first filler element;

filling said slots with at least one second filler element; and

inductive heating at least one of said end of the stator winding bar and said first connecting part, wherein at least one of said first and second filler elements comprise at least one layer of a material which melts during said heating step, and adding sufficient additional meltable material to assure complete sealing of said gaps and slots.

4. The method of claim 3 including the further steps of: visually inspecting said sealed gaps via said first connecting part; and

applying an electrically conductive second connecting part onto said first connecting part so as to form a complete connecting part.

5. The method of claims 1 including a step of cleaning said end of the stator winding bar after the step of removing the existing connecting device.

6. The method of claims 1 including a step of material-cutting machining said end of the stator winding bar after the step of removing the existing connecting device.

7. The method of claim 6 wherein said material-cutting machining comprises milling.
8. The method of claims 1 wherein at least one of said conductor elements is hollow.
9. The method of claims 1 wherein at least one of said conductor elements is solid.
10. The method of claims 1 wherein said step of removing an existing connecting device from the end of the stator winding bar comprises inductive heating at least one of said stator winding bar and said connecting device.
11. The method of claim 1 wherein groups of four of said conductor elements abut one another at points and said slots extend to said points.
12. The method of claim 10 wherein said slots form straight lines.
13. The method of claim 10 wherein said slots form intersecting sets of straight lines which intersect at said points.
14. The method of one of claims 2 wherein at least one of said first and second filler elements comprise a spacer element.
15. The method of one of claims 3 wherein at least one of said first and second filler elements comprise a spacer element.
16. The method of claim 8 including, after said slot forming step, the step of widening said hollow conductor elements at said end of the stator winding bar until edges of adjacent conductor elements touch one another.
17. The method of claim 16 wherein groups of four of said conductor elements abut one another at points and said slots extend to said points, including the step of drilling holes into said bar at said points and inserting pins of meltable material into the drilled holes.
18. A method of repairing a joint between conductor elements of a stator winding bar of an electrical machine and a connecting device connected to an end of the stator winding bar for providing electrical connection and coolant flow for the conductor elements, the method comprising the steps of:
- removing an existing connecting device from the end of the stator winding bar;
 - aligning the conductors of the end of the stator winding bar by heating the bar end to above the flow point of the braze holding the conductors in position while simultaneously holding the conductors of the end of the stator winding bar under compression in two orthogonal directions perpendicular to the length of the stator winding bar;
 - applying an electrically conductive first connecting part onto the end of the stator winding bar such that said first connecting part substantially surrounds said end of the stator winding bar; and
 - sealing any gaps between the end of the stator winding bar and said electrically conductive first connecting part.
19. The method of claim 18 including the step of maintaining the alignment of the conductors of the end of the stator winding bar during said sealing step.
20. The method of claim 19 wherein said maintaining step comprises:
- applying, in said applying step, an electrically conductive first connecting part having a window covered by a floating cover plate;
 - filling gaps between said first connecting part and an outer surface of said end of the stator winding bar with at least one braze filler element;
 - applying pressure to the conductors of the end of the stator winding bar via said floating cover plate; and

heating, in said sealing step, at least one of said end of the stator winding bar and said first connecting part to melt said at least one braze filler element, while maintaining said pressure.

21. A method of repairing a joint between conductor elements of a stator winding bar of an electrical machine and a connecting device connected to an end of the stator winding bar for providing electrical connection and coolant flow for the conductor elements, the method comprising the steps of:

- removing an existing connecting device from the end of the stator winding bar;
- cleaning said end of the stator winding bar;
- aligning the conductors of the end of the stator winding bar by heating the bar end to above the flow point of the braze holding the conductors in position while simultaneously holding the conductors of the end of the stator winding bar under compression in the two orthogonal directions perpendicular to the length of the stator winding bar;
- material-cutting machining said end of the stator winding bar;
- forming slots in the end of the stator winding bar and at locations such that said slots extend to locations where said conductor elements abut one another;
- applying an electrically conductive first connecting part onto the end of the stator winding bar such that said first connecting part substantially surrounds said end of the stator winding bar;
- filling gaps between said first connecting part and an outer surface of said end of the stator winding bar with at least one first filler element;
- filling said slots with at least one second filler element;
- sealing said gaps and slots by heating at least one of said end of the stator winding bar and said first connecting part, at least one of said first and second filler elements comprising at least one layer of a material which melts during said heating step, and adding sufficient additional meltable material to assure complete sealing of said gaps and slots;
- visually inspecting said sealed gaps via said first connecting part;
- applying an electrically conductive second connecting part onto said first connecting part so as to form a complete connecting part; and
- testing the repaired joint.

22. The method of claim 18 including the step of maintaining the alignment of the conductors of the end of the stator winding bar during said sealing step.

23. The method of claim 19 wherein said maintaining step comprises:

- applying, in said step of applying an electrically conductive first connecting part onto the end of the stator winding bar, an electrically conductive first connecting part having a window covered by a floating cover plate;
- applying pressure to the conductors of the end of the stator winding bar via said floating cover plate; and
- heating, in said sealing step, at least one of said end of the stator winding bar and said first connecting part to melt said at least one first filler element, while maintaining said pressure.

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--24. A method for providing an electrical and fluid connector on an electro-fluidic conductor, said electrical and fluidic connector having a first member and a second member that are separate and both electrically conductive, said second member having a fluid port that facilitates fluidic connection to a fluid conductor and said second member being configured to facilitate electrical connection to an electrical conductor, said method comprising the steps of:

(a) securing said first member to said electro-fluidic conductor such that said first member encircles an end portion of said electro-fluidic conductor and forms a fluid tight seal thereto, and electrically connects therewith; and

(b) matingly connecting said first member to said second member such that said first member and said second member define a hollow inner chamber that comprises a fluid tight chamber for passing fluid between said electro-fluidic conductor and said fluid port of said second member, and wherein said first member and said second member themselves define an electrical connection between said electro-fluidic conductor and said electrical conductor when said electrical conductor is attached to said second member.

25. The method of claim 24, wherein said method further comprises the step of removing a defective electrical and fluidic connector from said electro-fluidic conductor prior to said securing step (a).

26. The method of claim 25, wherein said defective electrical and fluidic connector comprises a single piece electrical and fluidic connector such that said method includes removing said single piece electrical and fluidic connector from said electro-fluidic conductor prior to said securing step (a).

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28. The method of claim 24, wherein said method further comprises the step of verifying said fluid tight seal of said securing step (a) prior to said matingly connecting step (b).

29. The method of claim 28, wherein said verifying step includes affixing a test cap to said first member and pressurizing said electro-fluidic conductor such that any leaks between said first member and said electro-fluidic conductor are detected.

30. The method of claim 24, wherein said securing step (a) comprises the step of brazing said first member to said electro-fluidic conductor using a first brazing alloy.

31. The method of claim 30, wherein prior to said brazing step, said securing step (a) includes placing said first brazing alloy around said end portion of said electro-fluidic conductor.

32. The method of claim 30, wherein said matably connecting step (b) comprises brazing said first member to said second member using a second brazing alloy having a lower melting temperature than a melting temperature of said first brazing alloy.

33. The method of claim 32, wherein said connecting step (b) comprises heating said first member and said second member to a temperature at least as high as the melting

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temperature of the second brazing alloy but lower than the melting temperature of the first brazing alloy such that the first brazing alloy does not melt during said connecting step (b).

34. The method of claim 24, wherein said first member has at least one groove on an outer surface thereof, and wherein said method further comprises inserting a third brazing alloy into said at least one groove such that said matably connecting step (b) comprises brazing said first member to said second member using said third brazing alloy.

35. The method of claim 34, wherein said matably connecting step (b) comprises inserting said first member flush into said second member prior to said brazing of said first member to said second member.

36. The method of claim 35, wherein said method includes placing a ribbon alloy on an outer surface of said first member after said inserting of said third brazing alloy into said at least one groove and prior to said inserting said first member into said second member, said ribbon alloy securing said first

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member to said second member as a result of
said brazing of said first member to said
second member.

37. The method of claim 24, wherein said
metably connecting step (b) comprises
inserting said first member into said second
member and brazing said first member to said
second member.

38. The method of claim 37, wherein said
method includes placing a ribbon alloy on an
outer surface of said first member prior to
said inserting said first member into said
second member.

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39. The method of claim 37, wherein said
method further comprises applying pressure
that forces said first member into said second
member during said brazing of said first
member to said second member.

40. The method of claim 24, wherein said
method further comprises the step of
connecting said electrical conductor and said
fluidic conductor to said electrical and
fluidic connector for facilitating electrical
and fluidic connection thereto.

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41. The method of claim 40, wherein said step
of connecting said electrical conductor and

said fluidic conductor to said electrical and fluidic connector comprises brazing said electrical conductor and said fluidic conductor to said electrical and fluidic connector.

42. The method of claim 41, wherein said fluidic conductor and said electrical conductor comprise a single conductive pipe such that said step of connecting said electrical conductor and said fluidic conductor to said electrical and fluidic conductor comprises brazing said single conductive pipe to said electrical and fluidic connector.

43. The method of claim 40, wherein said method further comprises the step of insulating the electrical and fluidic connector.

44. The method of claim 24, wherein said electro-fluidic conductor comprises a stator bar in a water cooled electric machine, and wherein said securing step (a) and said matably connecting step (b) are performed while said stator bar is installed in said water cooled electric machine.--